Rochester Quadrangle, Maine

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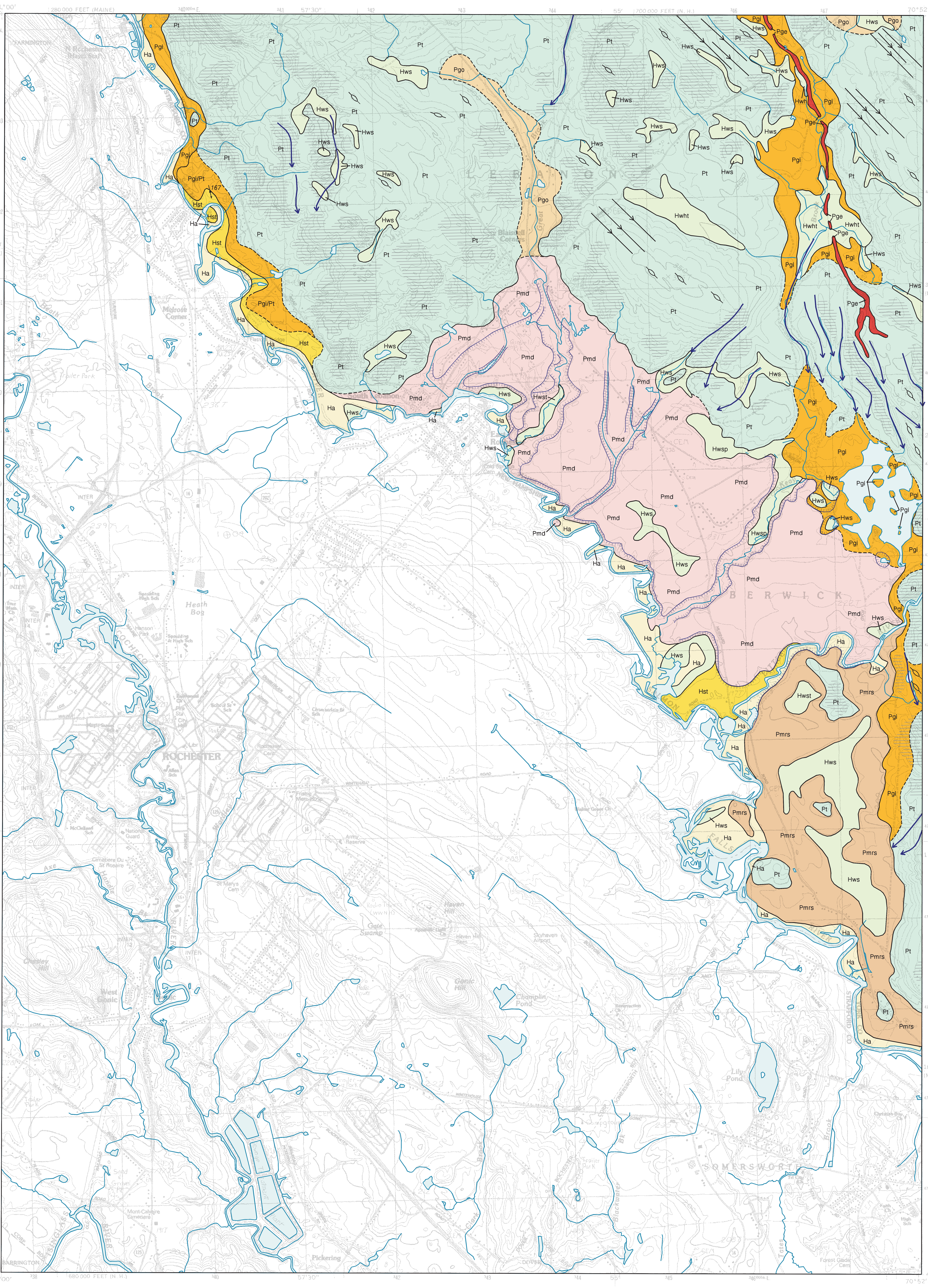
For additional information, see Open-File Report 99-129.

Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping by Geoffrey W. Smith completed during the 1989 field season; funding for this work provided by the Maine Geological Survey. Geologic unit designations and contacts revised and matched to adjacent quadrangles in 1999 by MGS geologists. Wetland information partly by Cornelia C. Cameron.

Quadrangle Location

SCALE 1 : 24,000

1 MILE — 7000 FEET — 1 KILOMETER

CONTOUR INTERVAL 10 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey Rochester quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

- **Ha** — **Stream alluvium** - Gray to brown fine sand and silt with some gravel. Comprises flood plains along present streams and rivers. Extent of alluvium approximates areas of potential flooding.
- **Hst** — **Stream terrace deposits** - Sand and gravel deposited on terraces cut by postglacial streams.
- **Hws** — **Wetland, swamp*** - Muck, peat, silt, and sand. Poorly drained areas, often with standing water.
- **Hwh** — **Wetland, heath*** - Peat and fine-grained inorganic sediment. Distinguished from other wetlands by the dominance of shrub vegetation.
- **Pgo** — **Outwash** - Sand, gravel, and minor silt deposited by glacial streams in a proglacial (away from ice) setting. Generally confined to river valleys. Sometimes terraced. Average thickness probably between 5 and 10 m.
- **Pmrs** — **Marine regressive sand deposits** - Sandy sediments deposited in the sea during regressive phase of marine submergence.
- **Pmd** — **Marine delta** - Coarse sand and gravel grading to sand and silt. Flat to gently sloping constructional surface formed by glacial streams discharging into late glacial sea. Heads of deltas are commonly kettled and mark ice frontal positions. Sediments in distal portions of deltas commonly grade into glacial marine sediments (Pp, Pmrs). Variable thickness from more than 30 m at delta head to less than 1 m at delta toe.
- **Pgi** — **Ice-contact deposits (undifferentiated)** - Coarse gravel and sand. Includes kettled glacial stream deposits in the immediate vicinity of eskers (Pge). Average thickness probably between 10 and 15 m.
- **Pge** — **Esker** - Coarse gravel and sand comprising distinct linear ridges. Generally surrounded by Pgi deposits and terminating in ice-contact deltas. May be more than 10 m thick.
- **Pt** — **Till** - Gray to gray-brown poorly sorted mixture of silt, sand, pebbles, cobbles, and boulders. Forms a blanket deposit over bedrock and is inferred to underlie younger sediments where not exposed at surface. Thin over topographic highs. Thickens in topographic lows. Averages 3 to 5 m in thickness.
- **Bedrock** - Bedrock of Paleozoic age. The ruled pattern indicates area where outcrops are common and surficial sediments are generally less than 3 m thick.
- **Contact** - Boundary between map units. Dashed where boundary is uncertain or inferred.
- **Scarp** - Scarp bordering channel cut into glacial sediments by late-glacial or postglacial stream.
- **Meltwater channel** - Channel eroded by glacial meltwater stream.
- **Kettle** - Depression created by melting of a buried mass of glacial ice and collapsing of the overlying sediment. May contain a small pond or wetland.
- **Grooved till** - Narrow ridges and grooves in till deposits sculpted by flow of glacial ice.
- 135 — **Glacial striation locality** - Dot indicates point of observation. Arrow shows direction of ice flow if known. Number is azimuth in degrees of ice flow direction.
- **Glacially streamlined hill** - Indicates a hill that has been elongated parallel to the direction of ice flow. The hill may be bedrock-cored.

*NOTE: Wetland symbols followed by "t" indicate areas where peat deposits probably do not constitute a significant commercial resource, either because they are thin (< 1.5 m), or they have an ash content greater than 25 percent. Symbols followed by "p" indicate peat deposits that are thicker (generally > 1.5 m), with ash content less than 25 percent, and thus may be suitable for commercial applications.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Smith, G. W., 1999, Surficial geology of the Rochester 7.5-minute quadrangle, York County, Maine: Maine Geological Survey, Open-File Report 99-129, 7 p.
2. Smith, G. W., 1998, Surficial materials of the Rochester quadrangle, Maine: Maine Geological Survey, Open-File Map 98-159.
3. Neil, C. D., 1998, Significant sand and gravel aquifers of the Rochester quadrangle, Maine: Maine Geological Survey, Open-File Map 98-125.
4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print)
5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.
6. Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, *in* Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological Survey, Bulletin 40, p. 43-67.